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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SIMS, JASON M	

ART UNIT	PAPER NUMBER
1631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,207	NADEL ET AL.	
	Examiner	Art Unit	
	JASON M. SIMS	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *66-99 and 137* is/are pending in the application.

4a) Of the above claim(s) *69,70,74-87 and 98* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *66-68, 71-73, 88-97, 99, and 137* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments, filed 4/6/2009, have been fully considered. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Applicants have amended their claims, filed 4/6/2009, and therefore rejections newly made in the instant office action have been necessitated by amendment.

Claims 69-70, 74-87, and 98 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventive group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/13/2008.

Applicant has newly added claim 137 in the response filed 4/6/2009, which is acknowledged and has been entered.

Applicant's cancellation of claims 100-136 in the response filed 4/6/2009 has been acknowledged and entered.

Claims 66-68, 71-73, 88-97, 99, and 137 are the current claims hereby under examination.

Claim Rejections - 35 USC § 112-First

Applicant's arguments, filed 4/6/2009, with respect to the rejections under 112-first have been fully considered and are persuasive because of applicant's amendments and arguments. Therefore the rejections have been withdrawn.

Claim Rejections - 35 USC § 112-Second

Applicant's arguments, filed 4/6/2009, with respect to the rejections under 112-second have been fully considered and are persuasive because of applicant's amendments and arguments. Therefore the rejections have been withdrawn.

Claim Rejections - 35 USC § 102-modified

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 66, 71-73, 88-99, and 134-137 are rejected under 35 U.S.C. 102(e) as being anticipated by Chan (P/N 6,355,420).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The claims are directed to a method of analyzing polymers through high resolution linear analysis. The polymer has first and second specific markers with first

and second specific labels at a separation distance; a detection zone is provided where a timing event is established and the polymer is moved through the detection zone at a velocity, whereby the first and second emissions by the first and second labels are detected and proportions of the first and second emissions are calculated and compared to determine the separation distance of the first and second markers.

Chan teaches claims 66, 71-73, 88-97, and 134-136 at col. 7 - col. 10. Chan at col. 7 and 8 discusses the analysis of polymers by analyzing a polymer as it is moving through a nanochannel. Chan teach at col. 58, lines 40-42 that the signals detected may be indicative of the distance between units in a polymer. Chan discusses at col. 8, lines 40-48, that the analysis may involve a measurement of the time elapsed between detected signals, which indicates the distance between two units or the length of the polymer. Chan further discusses at col. 8, lines 58-62, at least two units of the polymer are labeled differently so as to produce two different detectable signals. Furthermore, Chan teaches at col. 39-col. 44, different fluorescent signal detection schemes which can measure signals from labeled units of a polymer, such as single photon events, are detectable. Furthermore, Chan at col. 40, lines 55-58 teaches that efficient detection of both intensity and intensity changes, i.e. donor emission in the absence and presence of an acceptor are made, which inherently reads on detecting a proportion of an emission that corresponds to a distance of the detection zone. It is inherent because Chan teaches that the emission before the acceptor is present is measurable and the signal of when the acceptor is present is measurable and the difference between the two is calculated. The presence of the acceptor is the time and/or distance the labeled

unit is traversing the detection zone. It is further inherent because the detected signals of the first unit specific marker and second unit specific marker, which are detected as it passes through the detection signal, correspond to a distance of the detection zone that has been traversed by the label of either the first or the second unit specific marker at the timing events. Chan et al. further teach at col. 58, lines 59-63, that the signals detected are a temporal change, wherein a change fluctuates with respect to the detection of a signal, which reads on a detected signal that is reset after the timing event because of the temporal change indicating that the signal is detected and then set back to normal. Chan discusses at col. 10, lines 57-64, that the polymers may be any type of polymer known in the art, such as a nucleic acid or proteins and that different labels can be used to label different linked units to produce different signals, such as a fluorophore or an electromagnetic label.

Chan teaches at col. 39-col. 44, different fluorescent signal detection schemes which can measure signals from labeled units of a polymer, such as single photon events are detectable. Furthermore, Chan at col. 40, lines 55-58 teaches that efficient detection of both intensity and intensity changes, i.e. donor emission in the absence and presence of an acceptor are made, which inherently reads on detecting a proportion of an emission that corresponds to a distance of the detection zone as in claims 135-136. It is inherent because Chan teaches that the emission before the acceptor is present is measurable and the signal of when the acceptor is present is measurable and the difference between the two is calculated. The presence of the acceptor is the time

and/or distance the labeled unit is traversing the detection zone, which also establishes the timing event.

Response to arguments:

Applicant's arguments filed 4/6/2009 with regards to claims have been fully considered but they are not persuasive.

Applicant again argues that Chan does not teach or suggest determining a proportion of the first or second emission signal that corresponds to a distance of the detection zone traversed by the label of the first or second unit specific marker at the timing event and using such proportion to determine the distance separating two unit specific markers bound to a polymer.

Applicant's arguments are not found persuasive wherein the reasons are reiterated as Chan teaches at col. 45, lines 55-67 labeled units of polymers cause signal changes which are unit dependent. Furthermore, Chan teaches at col. 39-col. 44, different fluorescent signal detection schemes which can measure signals from labeled units of a polymer, such as single photon events, are detectable. Furthermore, Chan at col. 40, lines 55-58 teaches that efficient detection of both intensity and intensity changes, i.e. donor emission in the absence and presence of an acceptor are made, which inherently reads on detecting a proportion of an emission that corresponds to a distance of the detection zone. It is inherent because Chan teaches that the emission before the acceptor is present is measurable and the signal of when the acceptor is present is measurable and the difference between the two is calculated. The presence

of the acceptor is the time and/or distance the labeled unit is traversing the detection zone. Furthermore, Chan teaches that measuring a time elapse between the detection of signals to indicate the distance. Chan also teaches calculating velocity wherein if the data obtained comprises data before, during, and after a detection unit detects a signal and a velocity can be measured, then it is inherent from the obtained data that one of ordinary skill in the art through routine mathematical manipulation can compare also the proportions of the detected signals to determine distance, inasmuch as Chan already compares the time elapse between detected signals.

Claims 66-68, 71-73, 88-99, and 134-137 are rejected under 35 U.S.C. 102(e) as being anticipated by Gilmanshin et al. (P/N 6,263,286).

Gilmanshin et al. teaches claims 66-68, 71-73, 88-99, and 134 at the abstract, col. 5, lines 50-62, col. 14, lines 33-48, and col. 15, lines 30-67. Gilmanshin et al., in the abstract, discusses determining the spatial separation of specific sites within a polymer. Gilmanshin et al. in the background discusses how polymers can be biological macromolecules such as DNA. Gilmanshin et al. at col. 5, lines 50-62, discusses using a polymer, or extended object, that is similarly labeled with at least two unit-specific markers and passes through a station where the impulses, or signals, are measured and an autocorrelation function is calculated, which reads on a timing event and analyzes the polymer by determining the separation distance between the measured impulses or signals. Therefore, it is inherent that the detected signals of the first unit

specific marker and second unit specific marker, which are detected as it passes through the detection signal, corresponds to a distance of the detection zone that has been traversed by the label of either the first or the second unit specific marker at the timing events. Gilmanshin et al. at col. 14, lines 33-48, discusses the calculation of the separation distance between the two unit-specific markers. Gilmanshin et al. at col. 15, lines 30-67, discusses what the different polymers and what the different labels may be. Gilmanshin et al. at col. 4, lines 1-5 teach that fluorescence emitted by the fluorescent molecule, i.e. labeled unit, noticeably exceeds the background, which inherently reads on detecting the proportion of a first or second labeled unit. Gilmanshin et a. further teach that the detected fluorescent bursts and lengths of bursts are related to the time a molecule, i.e. labeled unit, spends within the illuminated volume. Moreover, the detection of the fluorescent bursts from a labeled unit inherently read on a detector that is set to detecting background signals before a labeled unit establishes a timing event, then detects emission bursts from a labeled unit, and goes back to detecting background signals after the labeled unit passes, which reads on a detection zone being reset.

Response to arguments:

Applicant's arguments filed 4/6/2009 have been fully considered but they are not persuasive.

Applicant again argues that Gilmanshan does not teach or suggest determining a proportion of the first or second emission signal that corresponds to a distance of the

detection zone traversed by the label of the first or second unit specific marker at the timing event and using such proportion to determine the distance separating two unit specific markers bound to a polymer.

Applicant's arguments are not found persuasive and are reiterated as Gilmanshan at col. 14, lines 40-47, teach that time dependence is measured for the fluorescence at the wavelength of a labeled end unit and provides information on the velocity of the molecule. A time dependence measurement of the fluorescent signal of a labeled unit inherently is measuring the proportion of the emission signal as the labeled unit is passing through a detection zone and thereby establishing a timing event. Furthermore, Gilmanshin teach that velocity is determined for a polymer wherein the velocity is used to help determine a distance. Thus it is inherent if the velocity for a molecule is known, then the proportions of their signals traveling through a detection unit may also be used for determining the separation distance through routine mathematical manipulations.

The following rejections are being newly made, which have been necessitated by amendment:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 67-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan (P/N 6,355,420) as applied to claims 66 and 134 above.

Chen suggest, but does not explicitly teach dividing the signal emitted from the label of the first unit specific marker before the first timing event by the first emission signal as similarly performing the same method step with the second signal as in claims 67-68.

Chen suggest this because Chen teaches as discussed above measuring the signal or emission before signal, during, and after a polymer moves through a detection zone, thus determining a timing event.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have identified a proportion of first or second emission signal that corresponds to the distance of the detection zone by dividing the signal emitted from the label of the first unit specific marker before the first or second timing event by the first or second emission signal as in the claimed invention for use in the method of determining a timing event as taught by Chen. This is because Chen teaches obtaining the data for the polymer and emission before, during and after it moves past a detection unit.

Therefore, one of ordinary skill in the art would have recognized that determining a proportion of an emission signal corresponding to the distance of the detection zone, by dividing the signal emitted from the label of the first unit specific marker before the first timing event by the first emission signal as similarly performing the same method step with the second signal from the obtained data, was within his or her technical grasp performed through routine mathematical manipulations, wherein the success is likely the product not of innovation, but of ordinary skill and common sense.

Claims 67-68, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilmanshin et al. (P/N 6,263,286) as applied to claims 66, 71-73, 88-99, and 134-137 above.

Gilmanshin et al. suggest, but do not explicitly teach dividing the signal emitted from the label of the first unit specific marker before the first timing event by the first emission signal as similarly performing the same method step with the second signal as in claims 67-68.

Gilmanshin et al. suggest this because Gilmanshin et al. teach as discussed above that time dependence is measured for the fluorescence at the wavelength of a labeled end unit and provides information on the velocity of the molecule. A time dependence measurement of the fluorescent signal of a labeled unit inherently is measuring the proportion of the emission signal as the labeled unit is passing through a detection zone and thereby establishing a timing event.

However, It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have identified a proportion of first or second emission signal that corresponds to the distance of the detection zone by dividing the signal emitted from the label of the first unit specific marker before the first or second timing event by the first or second emission signal as in the claimed invention for use in the method of determining a timing event as taught by Gilmanshin et al. This is because Gilmanshin et al. teach that time dependence is measured for the fluorescence at the wavelength of a labeled end unit and provides information on the velocity of the molecule wherein the obtained data for the polymer can inherently be used for measuring the proportion of the emission signal as the labeled unit is passing through a detection zone and thereby establishing a timing event. Therefore, one of ordinary skill in the art would have recognized that determining a proportion of an emission signal corresponding to the distance of the detection zone, by dividing the signal emitted from the label of the first unit specific marker before the first timing event by the first emission signal as similarly performing the same method step with the second signal from the obtained data, was within his or her technical grasp performed through routine mathematical manipulations, wherein the success is likely the product not of innovation, but of ordinary skill and common sense.

Conclusion

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marjorie Moran can be reached via telephone (571)-272-0720.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ Jason Sims /

/Michael Borin/
Primary Examiner, Art Unit 1631